WHAT IS CLAIMED IS:

1. A vehicle steering control system that determines a steering angle to be applied to a wheel steering shaft according to an operation angle to be applied to a steering wheel shaft for steering and an operation status of a vehicle, and rotates and drives the wheel steering shaft by a steering shaft driving motor constituted by a three-phase brushless motor so as to obtain the steering angle, comprising:

a steering wheel shaft angle detecting portion for detecting an angular position of the steering wheel shaft,

a steering shaft angle detecting portion for detecting an angular position of the wheel steering shaft,

an operation status detecting portion for detecting an operation status of the vehicle,

a steering control portion for determining a target angular position of the wheel steering shaft based on the detected angular position of the steering wheel shaft and the detected operation status of the vehicle, and controlling a rotation speed of the steering shaft driving motor based on a difference between the angular position of the wheel steering shaft and the target angular position by a PWM control method so as to control an operation of the steering shaft driving motor such that the angular position of the wheel steering shaft approaches toward the target angular position, wherein the PWM control method does not perform switching in a state in which a first terminal is connected to a first pole of a DC power supply, and performs switching in a state in which a second terminal is connected to a second pole of the DC power supply, wherein one of conducting terminals of a pair of two phase coils of the steering shaft driving motor that are simultaneously energized is made the first terminal while the other is made the second terminal,

terminal voltage detecting means for separately detecting a terminal voltage of respective phase coil of the steering shaft driving motor, and

failure determining means for determining a failure based on results obtained from a calculation performed to determine whether $V_1 + V_3$ coincides with $2*V_2$ within a predetermined allowable range, wherein detected values of the terminal voltages of three phase conducting terminals u, v, and w of the steering shaft driving motor are made Vu, Vv, and Vw, respectively, and values when the detected values Vu, Vv, and Vw are arranged in order from largest to smallest voltage are made V_1, V_2, and V_3, respectively, provided that $V_1 \geq V_2 \geq V_3$.

2. The vehicle steering control system according to claim 1, wherein the failure determining means performs a calculation to determine whether Vm coincides with 2*Vr within a predetermined range, wherein the sum of any two values selected from the detected values Vu, Vv, and Vw of the terminal voltages is made Vm and the remaining value is made Vr, while changing a combination of two detected values selected for calculation of Vm, and determines a failure of the steering shaft driving motor when a calculation result in which Vm coincides with 2*Vr is not obtained.

3. The vehicle steering control system according to claim 1, wherein the steering wheel shaft is mechanically disconnected from the wheel steering shaft,

the system further comprising:

a lock mechanism that can be switched between a lock state in which the steering wheel shaft and the wheel steering shaft are connected and locked in an integrally rotatable manner such that a manual operation force applied to the steering wheel shaft is transmitted directly to the wheel steering shaft, and an unlock state in which the connection and locking of the two shafts are released, and

lock control means that sets the lock mechanism in the lock state upon receipt of a failure determination result from the failure determining means, and stops the steering shaft driving motor.

4. The vehicle steering control system according to claim 2, wherein the steering wheel shaft is mechanically disconnected from the wheel steering shaft,

the system further comprising:

a lock mechanism that can be switched between a lock state in which the steering wheel shaft and the wheel steering shaft are connected and locked in an integrally rotatable manner such that a manual operation force applied to the steering wheel shaft is transmitted directly to the wheel steering shaft, and an unlock state in which the connection and locking of the two shafts are released, and

lock control means that sets the lock mechanism in the lock state upon receipt of a failure determination result from the failure determining means, and stops the steering shaft driving motor.